DRAFT
EPA R6 Strategic Plan - Ethylene Oxide Facilities
May 8, 2019

Introduction

On August 22, 2018, the US Environmental Protection Agency (EPA) released the National Air Toxics Assessment (NATA) which identified areas with potential health risks near 10 facilities emitting ethylene oxide (EtO) in EPA's Region 6. The NATA risk for these facilities is driven by a revision to EPA's Integrated Risk Information System (IRIS) value for EtO in December 2016.

EPA uses NATA[1] as a screening tool to provide information to state, local and tribal air agencies on potential health risks from breathing hazardous air pollutants, also knowns as air toxics. NATA results indicate potential health risks estimated for exposure over a lifetime (70 years) at the census tract level, which are small subdivisions of a county or parish. When NATA shows a potential cancer risk of greater than 100 in 1 million at a census tract level, it means there may be an elevated cancer risk in that tract. A risk level of 100 in 1 million (also referred to as 10^{-4} or one in ten thousand) refers to the likelihood that 100 in 1 million people would develop cancer if they breathe air containing the same amount of the same air toxic for 70 years. For EtO, the 2016 IRIS value for 100-in-1 million risk level concentration is 0.011 parts per billion (ppb) or 0.02 micrograms per cubic meter ($\mu g/m^3$).

EPA has concluded that EtO is carcinogenic to humans by the inhalation route and lifetime exposure. Evidence in humans indicates that exposure to EtO increases the risk of lymphoid cancer and, for females, breast cancer. EtO is used primarily as a chemical intermediate in the manufacture of ethylene glycol. EtO is also used as a sterilizing agent for medical equipment and a fumigating agent for spices and pet food.

EPA is taking the following efforts in response to NATA:

1. Responding to a Request for Correction: The EtO industry has requested a correction of how the EtO emission and risk data are applied in the NATA risk model. [Kelly Rimer (OAQPS)/Ted Berner (ORD)]
2. Conducting risk and technology reviews (RTRs) of appropriate regulations
3. Engaging with our State partners on a collaborative path forward

Section 1. Long and Short-Term plans

A. Two Prong Approach -- Long Term

a. RTRs – Long-term

There are two types of CAA statutory 8-year reviews of MACT regulations. The initial review specifically requires EPA to evaluate residual risk and evaluate technologies that are available to industry to control or prevent air pollution and is known as an RTR review. The subsequent 8-year technology reviews require that the EPA review and revise the MACT standards, as necessary, to account for improvements in air pollution controls and/or prevention practices.

i. Miscellaneous Organic Chemical Manufacturing NESHAPs (MON) for chemical manufacturing

The EPA is conducting a residual risk and technology review of the available technologies for control of EtO emissions from applicable MON facilities (40 CFR Part 63 Subpart FFFF). The

[1] NATA is calculated using the 2014 emissions inventory of air toxics.

MON includes facilities that produce and use EtO in their manufacturing processes. A proposed RTR rule is expected this summer with a final rulemaking by March 13, 2020.

ii. MACT for sterilization facilities

There are two regulatory reviews for Ethylene Oxide Emissions Standards for Sterilization Facilities. A proposed rule for commercial sterilization facilities is expected this summer.

b. Regional Priorities – Short-term

Identify NATA facility list based on highest estimated NATA risks A tentative EPA R6 NATA-based facility list is provided in Section 2 below. NATA lists can differ depending on how they are derived. There are differences in State lists.

R6 will talk with our state partners to reconcile any differences in the EPA and State NATA lists.

i. Engage and Cooperate with R6 States

4/2/19 letter sent to TX & LA

A R6 letter was sent on 4/2/19 to LDEQ & TCEQ to formally engage them in efforts ot address EtO.

- Updates on EPA nationwide efforts
- Discussing a joint approach on addressing EtO in Region 6
- Seeking EtO emission assessment and reduction opportunities
- Stakeholder/Public/Community communication and outreach efforts

4/23/19 meeting between Region 6 and TCEQ & LDEQ representatives

In general, the following items were discussed and agreed to. More specific details are below.

- All parties were very cognizant about the sensitive nature of public information on EtO
- States will be in the lead for EtO actions, communication and stakeholder engagement
- R6 agreed to provide EtO information, updates and forecasts to the States
- A follow-up conference call was agreed to be held in approximately 45 days
- An action item list from that meeting is below with updates noted by the table date.

Action Items
DRAFT 5/22/19 Update

Action/Steps	**Responsible Party**	**Timeframe**	**Status** *(as of 5/16/19)*
Communication • *Share materials* • *Joint messaging*	Diane Taheri		Coordinate with LA/TX communications contacts (What's being done? Who's involved? Next steps?) Per Lisa Bokun: No specific action items at this time. R6 has nothing to share now beyond national info Should we delete this item?
2014 NATA facility lists • *Arrange calls with TX & LA* • *Discuss how NATA lists were derived and reconcile any differences* • *Share 2017 OAQPS revised risk data*	Fran Verhalen Ruben Casso	5/3--24/19	Original NATA list above 10^{-4} Verify the 2017 emissions inventory numbers. Request states send us 2018 EtO inventories • 5/10 OAQPS shared revised risk numbers • New HQ data under review • 5/13 R6 told about IG state EtO facility requests
Arrange call between TX/LA & ORD to discuss TX effects screening level (ESL) & IRIS RFC. Ask if extension is possible for RFC comments *Find available dates/times & schedule call* *Conduct call & identify next steps*	Wren Stenger	5/17/19	• TCEQ provided available dates & times for LDEQ provided two available dates • ORD briefed and advised of request status.' • Call scheduled for 5/28 at 1:30 pm
Determine chemical plant EtO emission points, amounts, and rule applicability to those points • *List of sites needing more detailed data* • *Obtain detailed data & share with States*	Steve Thompson Jeff Robinson	May	Seek additional input from TCEQ and LDEQ on any facilities that they believe are significant sources outside of the 5 facilities EPA discussed. HQ new risk data review will support this effort.
Consider potential to incorporate EtO into the Dow/Union Carbide consent decree	Cheryl Seager Steve Thompson	5/10/19	04/30/19: Request made to case team to discuss with Dow/Union Carbide
Requests to OAQPS *Is it possible to expedite helpful RTRs/MACTs*?	Fran Verhalen Ruben Casso	5/17/19	• Turbines proposed MACT RTR sent to TX/LA • HQ to share future rule comment opportunities

List of MACT rule public comment opportunities *Facts on ATSDR data requests to EPA & TCEQ*			
Monitoring Methods – information sharing *Arrange call between LDEQ and OAQPS* • *Find available dates/times & schedule* • *Conduct call & identify next steps*	Fran Verhalen Ruben Casso	5/3/19 5/10/19	• R6 reached out to LDEQ air monitoring contact • LDEQ provided available dates &times for call • OAQPS informed of call request and status • Call scheduled for Thurs May 23rd at 11:00 am
Follow-up conference call with States (45 days) • *Find available dates/times & schedule* • *Conduct call & identify next steps*	Wren Stenger	5/10/19 Week of June 3, 2019	

Section 2. State Collaboration

A. State Actions

a. Louisiana

i. On November 8, 2018, LDEQ issued letters to all its facilities asking for voluntary reductions. LDEQ has held several meetings with the facilities identified with EO emissions that may be causing elevated offsite risks. LDEQ also sent a letter to the facilities encouraging them to evaluate their EO emissions and take any proactive steps to reduce the emissions.
LDEQ plans to follow-up to receive updates from the companies they contacted in their letter.

LDEQ has been communicating with a Korean firm on an air monitoring method that may be able to detect EtO at lower levels than EPA can currently reliably achieve, possibly down to 0.01 ug/m^3.
R6 agreed to arrange a call between LDEQ and OAQPS to share EtO air monitoring information.

b. Texas

TCEQ is doing a systematic review of their state screening level for EtO. TCEQ's preliminary EtO effects screening level (ESL) is vastly different from EPA's IRIS value, by a factor of 1,000. They may go public with their draft assessment in as soon as 60 days. That schedule may change depending on whether TCEQ undergoes a formal peer review on their draft ESL, which is likely.

R6 agreed to arrange a call between TCEQ & ORD. LDEQ asked to participate in the call as well.

TCEQ has commented on the Request for Correction on the EPA EtO IRIS value. They would like an additional 6 months to provide comments and move forward with their ESL peer review.

Industry is also asking TCEQ to comment on proposed EPA air toxics regulations where ethylene oxide facility-wide risks are mentioned, but are not part of EPA decisions on those specific rules.
R6 agreed to inform the states of opportunities to submit comments on EPA rules related to EtO.

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Section3. Communication

A. IntraAgency Coordination

EPA has established a national work group and calls to coordinate regional efforts for consistency. Lew Weinstock and Alison Davis are the OAQPS technical and communications national EtO coordinators.

OAQPS has also established an EtO SharePoint site and is adding useful documents and tools to it.

The Agency for Toxic Substances and Disease Registry (ATSDR) has asked the following questions of EPA:

1. If EPA has any EtO air modelling data or is/has conducted EtO air sampling related to a medical sterilization facility.
2. Do the regions know of any medical sterilization facilities in their states?

ATSDR requested a response from EPA by April 17th. OAQPS had a call with ATSDR on 4/3/19 and will be providing ATSDR and the EPA EtO workgroup the official agency response.

TCEQ informed EPA that they had been contacted by ATSDR as well. R6 provided TCEQ the information above and agreed to investigate further into this mater and share updates with the States.

B. External Outreach

i. Environmental Justice

Prior to the release of NATA in August 2018, EPA spoke with the Louisiana Environmental Action Network to relay information about EtO and the potential impact on the communities in areas near facilities that emit EtO. The Region 6 Environmental Justice staff has run EJSCREEN for the areas around some NATA EtO facilities

ii. Availability of Data and information

EPA R6 is developing a Communication Plan that addresses questions about areas identified for potential further evaluation in the 2014 NATA...
R6 agreed that the states will deliver information on ethylene oxide to their external stakeholders
R6 agreed to share EPA EtO communication materials and technical information with the states.

C. Ethylene Oxide Emissions Testing and Ambient Sampling

Emissions Testing

EPA is evaluating procedures for measuring ethylene oxide from relevant facilities and processes. OAQPS has provided a source testing for ethylene oxide toolkit summary to the EtO SharePoint site.

Ambient Sampling

EPA is revising its standard methodology to develop a process to lower the method detection limit to show lower concentrations of EtO commensurate with the risk values. EPA has modified its preparation procedures prior to analysis for EtO to address interferences from other chemicals.

Progress to date for a. and b. has improved ethylene oxide detection level from 0.1 to 0.08 micrograms/cubic meter.

EPA air monitoring near an Illinois sterilizing facility that uses ethylene oxide detected upwind/background levels of EtO that appear to be coming from sources other than the monitored facility. EPA plans to look into if and how background levels of EtO will be considered going forward.

OAQPS has provided an "Ethylene Oxide Monitoring in Ambient Air Summary" and a "Source Testing – Ethylene Oxide" Summary to the SharePoint toolkit site. R6 has heard that these two informational documents can be shared with the states.

LDEQ has been communicating with a Korean firm on an air monitoring method that may be able to detect EtO at lower levels than EPA can currently reliably achieve, possibly down to 0.01 ug/m^3. R6 agreed to arrange a call between LDEQ and OAQPS/ORD to share EtO air monitoring information.

D. Compliance Evaluation

EPA conducted an initial compliance screen of the list of 10 facilities identified through the NATA. This compliance screen focused on determining whether the facilities had any apparent noncompliance that was resulting in emissions of ethylene oxide. EPA assessed whether the facilities were emitting emissions in excess of permitted limits and evaluated whether the facilities may have undertaken recent expansions that could have triggered New Source Review permitting requirements. EPA's off-site compliance evaluations have not identified noncompliance associated with ethylene oxide emissions.

EPA has also offered assistance to our States in conducting on-site inspections at the 10 ethylene oxide facilities. These on-site inspections would allow for a more focused evaluation of the facility's compliance with Clean Air Act MACT Standards applicable to the EtO emissions.

Section 4. Region 6 NATA Facilities

Within Region 6, the NATA identified areas associated with 10 facilities that had elevated cancer risk (greater than 100 in 1 million persons) from EtO. The ten facilities are identified in the table below.

Five Region 6 EtO facilities were in areas that had NATA estimated risks greater than 1,000 in a million. The preliminary NATA evlauation information below has been shared with OAQPS, TCEQ & LDEQ. **2017 NATA Evaluation for Region 6**

- Emission reductions since the 2014 NATA was released *(2017 data used table/lists below)*
- OAQPS agreed to provide updated risk evaluations for some R6 EtO facilities
- R6 will evaluate the new OAQPS information once it is received.
- R6 will inquire about obtaining 2018 EtO EI data from LDEQ & TCEQ
- R6 will obtain State input on Region 6 2014 NATA EtO facility list
  R6 will discuss any potential changes/updates to the NATA lists below with the States

2014 NATA and 2017 Emission Inventory/TRI reporting updates with NATA Risk and Adjusted Risk
DRAFT March 20, 2019

Facility*	**2014 NATA EtO emissions (lbs)**	**2014 NATA Risk**	**2017 EI EtO emissions (lbs)**	**% Difference**	**2017 Adjusted Risk****	**Risk**
BCP Ingredients St. Gabriel, LA	5,003	2,539	4,260	-14.9	2,162	$>10^{-3}$
Union Carbide Hahnville, LA	20,860	1,680	11,159	-46.5	899	$>10^{-4}$
Huntsman Port Neches, TX	21,552	1,456	40,609	+88.4	2,743	$>10^{-3}$
Eastman Chemical, Longview, TX	14,828	1,355	12,893	-13.0	1,178	$>10^{-3}$
Taminco Chemical (Eastman Corp.),	2,299	1,330	1,606	-30.1	929	$>10^{-4}$

St. Gabriel, LA						
Sasol Westlake, LA	12,640	841	16,449	+30.1	1,094	$>10^{-3}$
Evonik (formerly Air Products) Reserve, LA	3,222	831	2,494	-22.6	643	$>10^{-4}$
Shell Technology Center, Houston, TX	919	291	318	-65.4	101	$>10^{-4}$
Midwest Sterilization, Laredo, TX	15,738	219	14,845	-5.7	207	$>10^{-4}$
Sterigenics, Santa Teresa, NM ***	5,761	135				

* Ten facilities listed in 2014 NATA with risk greater than 10^{-4}
**Assumed linear adjustment using a percent difference between the 2014 and 2017 EI
*** 2014 NATA risk based on TRI and not EI
Note: Ethylene oxide concentration associated with increased cancer risk of 1 in 1,000,000 = 0.2 ng/m^3 or 0.0002 ug/m^3

Other Considerations

[1] EPA/DOJ Supplemental Environmental Project (SEP) negotiations are in progress with Union Carbide
[2] Evonik is in relatively close proximity to the Denka Performance Elastomer facility in La Place, LA
[3] Midwest Sterilization & Sterigenics are geographically isolated with no obvious residential population nearby

Draft List Recommended High Priority facilities *(as of 3/20/19)*

Huntsman - Port Neches, TX
Eastman Chemical - Longview, TX
BCP Ingredients - St.Gabriel, LA
Sasol – Westlake, LA
Possible addition: Taminco (LA)